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(54) UREA GREASE COMPOSITION FOR CONICAL ROLLER BEARING

(57)Abstract:

PURPOSE: To obtain a composition suitable as a lubricant for a conical roller bearing used under conditions of a high-speed rotation, a high load and a high impact load by mixing a urea grease with an oxidation-modified polyolefin or an acid-modified polyolefin.

CONSTITUTION: This composition is obtained by mixing a urea grease with 0.5-5wt.% oxidation-modified polyolefin and/or an acid-modified polyolefin. The composition is excellent in lubricating properties for the sliding friction part of a conical roller bearing under a high thrust load, and in mechanical stability, wet shearing stability and pressure transferability required of a grease for the roll neck bearing of a rolling mill. When this composition is used, the lead from the bearing is small, and it can be held inside the bearing and is hardly depleted.

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[WHAT IS CLAIMED IS:]

[Claim 1]

Polyolefin that acid number denatures oxidation of 1.0-25mg KOH/g molecular mass 1500-5000 in urea grease and molecular weight 1500-5000 are urea grease composition for roller bearing.

[DETAILED DESCRIPTION OF THE INVENTION]

[a field of industrial application] circle employed in high-speed revolution and high load is breathed, and circle having the ability which is optimum is breathed as lubricant of roller bearing, and the present invention relates to urea grease composition for roller bearing. More in detail, The present invention relates to grease it is breathed circle having the lubricity ability which it can cope enough in situation employed in and it is taken in progress of it is needed in cooling water of mass a certain, even more particularly, such bearing rolling facilities, more severe condition roller bearing for.

[prior art:], conventionally, lithium system extreme pressure grease is employed as a master for lubricant of high-speed revolution, high load and hot rolling airplane roll neck bearing employed under impact load condition high. However, Because the metal compound which is extreme pressure agent, sulfur compound and phosphorus compound are included a lot within lithium system extreme pressure grease, grease is easy to disassemble and there are material of other and issue that condition of grease becomes bad to make it is responded, and the whole grease deteriorate. In addition, Is assumed that urea grease comprises near lubricity in lithium system extreme pressure grease even if it is different from metallic soap group, and extreme pressure agent is not doped, it is superior in heat resistance, application quantity tends to increase year by year. However, As for the urea grease, there is issue not to be able to satisfy enough hydrous shear stability as opposed to aqua used by the cooling which is in machine soundness and bearing for temperature range. Therefore, Even if, as for the roll neck bearing of finish calender down stream of stepless hot rolling arrangement of iron and steel, an axis diameter is massive, and, high speed spin, there is load under severe condition than conventional lithium system extreme pressure grease and urea grease high so that and is used impact load in adverse condition of penetration to bearing internal of cooling water of bearer, high temperature and mass high, good grease of lubricity ability is called for.

[a problem to be solved by the invention] scholars of present invention take warning by the real condition to suffer from, as a result of having repeated investigation zealously, high-speed spin breathed load and circle employed under impact load high high, and circle having the ability which was optimum was breathed as lubricant of roller bearing, and urea grease composition for roller bearing was found.

[a means for solving problem] the circle that % by weight (referred to as, %) addition mixes acid modification polyolefin 0.5-5 of specific oxidation degeneration polyolefin and specify in urea grease as for the present invention, and it is is breathed, and urea grease composition for roller bearing is related to.

[embodiment] it is breathed, and urea grease composition for roller bearing can use various lubricating oil such as paraffin series liquid petrolatum of 7-25 cSt, the synthetic oil which, for example, seem to be Polybutene such as poly - alpha - olefin such as H *mediamu* (HM) (Nihon Kojun product made in Nihon Kojun Co., Ltd.) P3DO (a product made in Nihon Kojun Co., Ltd.), H V I -160 S (a product made in Showa Shell Sekiyu K.K.), H V I -160 B (a product made in Showa Shell Sekiyu K.K.), H V I -650 (a product made in Showa Shell Sekiyu K.K.), *sutanoru* 66 (a product made in Esso Standard Oil Co., Ltd.), MCP90 (a product made in Idemitsu Kosan Co.,Ltd.), MCP -430 (a product made in Idemitsu Kosan Co.,Ltd.), liquid petrolatum system lubricant of M150N (a product made in Kyodo Oil Co., Ltd.) and PA OL -60 (a product made in burei company), ester of *adekarubu* 60ZO1A (a product made in Asahi Denka Kogyo K. K.), H V -100 (a product made in Nippon Petro Chemicals Co.,Ltd.) at 100 degrees Celsius as base oil circle of the present invention, in diisocyanate and monoamine of quantity determined by carbuncle having the butterfly degree which is desired as product in that, it is reaction formula:



(out of equation, as for R^1 and R^3 , linear of carbon number 8-22 or branch connection-shaped alkyl group or alkenyl group, R^2 express aromatic hydrocarbon radical of 2 values of carbon number 6-15), even more particularly, addition mixes oxidation degeneration polyolefin and acid modification polyolefin 0.5-5%, and it is got the diurea chemical agent which it is reacted according to shown reaction, and is got by urea grease containing 3-15% as thickener. In addition, In the present invention, commercial diurea grease may be used as urea grease containing diurea compound as thickener. Octyl amine, mosquito prill amine, lauryl amine, milli- still amine, palmityl amine, oleylamine and stearylamine are given for aromatic diisocyanate such as 4,4 diphenyl-methane - \square CE - diisocyanate and 2,4- *torirenjiishianeto* and monoamine for the diisocyanate which is charge stock of diurea compound to use for the present invention. In addition, Acid value may use acid modification polyolefin of 30-60mg KOH/g oxidation degeneration polyolefin of 1.0-25mg KOH/g and molecular weight 1500-5000 acid value molecular weight 1500-5000 which now is marketed for oxidation degeneration polyolefin and acid modification polyolefin, higher than one kind or two kinds are mixed, and grease medius inclusion factor of the present invention uses for the purpose of it being to 0.5-5.0%. The thing which alkyl group of carbon number 2-8, carboxyl group, keto group, aldehyde group, hydrogen radical and alkyl carboxyl group or the anhydride couples with main chain of polyolefin as degeneration group for the degenerative polyolefin is used. For example, Degeneration polyolefin oxidized in oxygen or oxygen-containing gas is given to maleic acid, fumaric acid, *chitorakon* acid, itaconic acid, unsaturation polyvalence carboxylic acid of *haimikku* acid or these acid anhydride, the degeneration polyolefin which made make unsaturation polyvalence carboxylic acid chemical agent of alkyl ester grafting and the degeneration polyolefin which grafting was able to put it in in the presence of peroxide or the polyolefin which made melt. Degeneration of polyolefin with the use of oxidation method such as oxidation by nitric acid, ozonation, air oxidation is said in the present invention that oxidation is degenerative. Degeneration making polyolefin make unsaturation polyvalence carboxylic acid chemical agent such as unsaturated polyvalence carboxylic acid or acid anhydride of these, alkyl ester grafting with acid modification is said. Oxidation degeneration polyolefin of being above-mentioned and acid modification polyolefin are principally used as polishing agent of abrasion proof additive of lubricant of various resin, printing ink or coating, motor or floor and textile processing adjuvant conventionally. Because additive amount of degenerative polyolefin is 0.5% less, and there is a too little additive amount, and lubricity ability improvement is small, because there is a little effect, and rate of the thickener which starts butterfly degree 0 used for general, 1 or butterfly degree of 2 when 5% are gone over, and it dopes (diurea compound) is expected requirement rate, and, even more particularly, degeneration polyolefin is doped by mass, degeneration polyolefin seems to contain 0.5-5% within grease so that grease becomes hard, and is doped. At the same time as, as for degenerative polyolefin shows superior lubrication in blending lubrication territory including boundary lubrication condition, and comprising depression effect of bearing temperature rise, lubricating oil membrane becomes dilute, and rubbing by metal-to-metal contact becomes drastic, augmentation of evolution of heat by rubbing well forms oil slick larger than oil slick of conventional base oil by parent sum adsorption to a surface of metal by degeneration radical in beginning blending lubrication domain, effect, coefficient of friction disturbing that boundary lubrication is in a condition are kept low, it is thought that evolution of heat is reduced. The present invention is explained based on embodiment in the following, but, the present invention is not a thing limited to only embodiment to take. Class and attribute of the degenerative polyolefin which employed in embodiment are shown to table 1. While 305 parts of paraffin series mineral oil of kinematic viscosity 15.2cSt of example 1 100 degrees Celsius (at) 30% made in) 70% made in H V I -160 S (Showa Shell Sekiyu K.K., H V I -650 (Showa

Shell Sekiyu K.K.) (referred to as, base oil) (part by weight, following similar) and 4,4 diphenylmethane - \square CE - diisocyanate 36.4 parts are taught reaction kettle, and heating, it was spatulated, and it was done to 50 degrees Celsius. While 220 parts of base oil and octyl amine 31.9 parts are put in another beaker, and spatulating a mixed thing in the reaction kettle, it was put, and it was reacted. Temperature became 85 degrees Celsius by heat of reaction. It heats little by little, and it is spatulated, while keeping 85-95 degrees Celsius, it made it was spatulated for 10 minutes, and reaction finish. While 220 parts of base oil and stearylamine 11.7 parts are put in another beaker, and keeping 70 degrees Celsius by heat, it was spatulated, and stearylamine was dissolved in base oil. It heats as well as the reaction kettle little by little, and this is spatulated, while keeping to 90-100 degrees Celsius, after having spatulated for 30 minutes, even more particularly, 170 degrees Celsius are heated to, it made it was spatulated in the temperature for 30 minutes, and reaction finish. External wall of the *nochi* reaction kettle was cooled to 70 degrees Celsius by means of *rei* oil. In addition, After 15 parts doped degenerative polyolefin 1 shown in table 1 to 160 parts of base oil in another beaker, and it heated, and having dissolved in 140 degrees Celsius, it was cooled to 70 degrees Celsius. After began the reaction kettle, and having spatulated this for 10 minutes, it is carried out, and it miringushi in three steps of roller mill, and grease is got, it was done with sample. Quantity of blending of charge stock used for got sample is shown to table 2. Combination quantity shown in the table uses degenerative polyolefin 2 shown in table 1 and material shown in table 2, and, according to method same as example 2 example 1, grease is got, it was done with sample. Combination quantity shown in the table uses degenerative polyolefin 6 shown in table 1 and material shown in table 2, and, according to method same as example 3 example 1, grease is got, it was done with sample. Combination quantity shown in the table uses degenerative polyolefin 7 shown in table 1 and material shown in table 2, and, according to method same as four embodiment example 1, grease is got, it was done with sample. Combination quantity shown in the table uses degenerative polyolefin 8 shown in table 1 and material shown in table 2, and, according to method same as five embodiment example 1, grease is got, it was done with sample. 14.3 parts *jinkujichiofuosufueto*, naphthenic acid lead 16.6 parts and 16.7 parts sulphurization olefin were put in quantity shown in table 2, the battledore and shuttlecock agitator which grease entered as extreme pressure agent to 952.4 parts sample got in six embodiment example 1, and it was mixed, and sample was got. It dopes, and one comparative example degeneration polyolefin is not mixed, it wants to be done in method same as example 1, and combination quantity shown in the table uses charge stock shown in table 2, and grease is got, it was done with sample. It dopes, and two comparative example degeneration polyolefin is not mixed, it wants to be done in method same as embodiment 6, and combination quantity shown in the table uses material shown in table 2, and grease is got, it was done with sample. Combination quantity shown in the table uses degenerative polyolefin 8 shown in table 1 and material shown in table 2, and, according to method same as three comparative example example 1, grease is got, it was done with sample. Combination quantity shown in the table uses degenerative polyolefin 1 shown in table 1 and material shown in table 2, and, according to method same as four comparative example example 1, grease is got, it was done with sample. With 5-7 comparative example comparative examples 5-7, foreign commercial article urea grease of class was used as sample respectively. It was offered in example 1 to 6 of being above-mentioned and a property to describe the following sample of comparative example 1-7 and ability assessment examination. (flexibility and thermoduric evaluation) a butterfly degree and a drip-point check butterfly degree and drip-point examination wanted to do to JIS - K 2220, and it was done. The result is shown to table 2. A purpose of use of the present invention, principally, a No. 1 butterfly degree (code:) It was put in code, and, with the thing which studied grease of 310-340), it was compared with all sample. (appraisal of oil separation soundness) *ri* oil degree *shigenri* oil degree check wanted to be made JIS - K 2220, and it was done. The result is shown to table 2. Comparative example 6 was massive with 6.2% at 100 degrees Celsius and was massive with 5.8% of 6.3% of comparative example 2, 12.5% of comparative example 4, comparative example 6 at just 150 degrees Celsius. (appraisal of machine soundness) by means of shell roll testing machine of shell roll test ASTM (American Society For Testing Materials) - D1831, it drives at 80 degrees Celsius and 130 degrees Celsius for each aqua 0% 24 hours, the good or bad of machine stability was watched by size of examination anteroposterior butterfly degree variation. The result is shown to table 2. Demineralization in particular and the grease which do not do hardening either are preferable. There

is not an established theory, but, a No. 0 butterfly degree (code:) If there is in upper limit area of 355-385), it is thought that it is preferable. Comparative example 7 was defectiveness to nanku at 80 degrees Celsius. In addition, All the embodiment was good. (appraisal of hydrous shear soundness) by means of shell roll testing machine of shell roll test ASTM - D1831, 10% soaked sample grease with aqua, and it was examined. It drives at 40 degrees Celsius and 80 degrees Celsius for 24 hours, the good or bad of hydrous shear stability was watched by size of check anteroposterior butterfly degree variation. The result is shown to table 2. Demineralization in particular and the grease which do not do hardening either are preferable. There is not an established theory, but, a No. 0 butterfly degree (code:) If there is in upper limit area of 355-385), it is thought that it is preferable. It was at 40 degrees Celsius, and, as for comparative example 7, comparative example 6 softened with 40 degrees Celsius and defectiveness to lack in *nan* at 80 degrees Celsius. In addition, Comparative example 5 stiffened at 40 degrees Celsius a little. In addition, All the embodiment was good. (appraisal of lubricity ability) steep grade form circle is sucked in, and high thrust load test (referred to as, P V check) steep grade circle by roller bearing is breathed, and an outer ring of roller bearing (70mm inside diameter phi, 150mm outside diameter phi) is fixed to bearing housing, it is slippery in rotation axis supported in two subiculum bearing in inner race, and it is *no*, if it will be, it is had firmly, and it is crowded, it is pushed, and circle is breathed, and end side is gone to from small end side of roller bearing very much, and thrust load is hung in thrust direction in fluid pressure in bearing housing, drum test was done. This thrust load absorbs circle, and big face pressure is given a roller large end face and inner race collar slideway. * on terminal was installed in inner race large diameter collar face this thrust load and number of revolutions could cope with condition of real bearing and to measure temperature change by rubbing of this division. This check is usually begun from low load, number of revolutions, and condition is done tightly sequentially, temperature amplitude with the highest temperature and minimum temperature of the stage which the highest temperature and the highest temperature of bearing inner ring collar in three lines of matters of condition 1-3 shown in table 3 were shown in in the final examination is measured, the result is shown in table 2. In addition, Grease of the present invention is principally roll bearing business of steel making calender in condition 1 and 2, and cooling water for roll cooling suffers from bearing housing in mass, misce did industrial water of grease 10% it considerably entered in bearing, and to give grease effect, and it was examined. The highest temperature is equal to or less than 100 degrees Celsius with example 1 to 6 and comparative example 4 and 6 with condition 1, but, comparative example one or two, 3, 5 and 7 were high more than 105 degrees Celsius and temperature amplitude was massive more than 10 degrees Celsius, too. As for example 1 to 6 and comparative example two or three, 4 and 6, the highest temperature is equal to or less than 130 degrees Celsius with condition 2, but, as for comparative example 1, 5 and 7, 130 degrees Celsius are older than and but, as for the temperature amplitude, example 1 to 6 and comparative example 4 and 6 are equal to or less than 3 degrees Celsius, comparative example one or two, 3, 5 and 7 were considerably massive more than 12 degrees Celsius. Example 1 to 6 is 130 degrees Celsius with condition 3, but, comparative example 1-7 were more than 140 degrees Celsius, and example 1 to 6 was superior in autumns. Comparative example one or two in particular, 5 and 7 become more than 165 degrees Celsius, because it was canceled so that there was the danger that testing machine resulted in failure, the log did more than 165 degrees Celsius. In addition, With condition 3, check time of the temperature is put together, from bearing of grease after 13.5 time, it flows out, and leak quantity of sample from bearing internal is measured in weight by reason of sex namely retention sexual assessment of grease in bearing housing, of the quantity which it well bonds in bearing, and stay, it measures in the weight which deducted leak quantity, bearing housing persistence quantity and grease is sheared in bearing in persistence quantity in bearing for assessment all-out to some extent by encapsulation grease quantity, butterfly degree variation is measured after examination anticus and examination for assessment of the degree to soften, and the differential is done with butterfly degree variation, the result is shown in table 2. Quantity of leak was equal to or less than 160g in example 1 to 6 and comparative example 1-4, and, as for comparative example 5-7, 160g were older than, and, as for example 1 to 6, retention characteristics were good in general. In addition, Example 1 to 6 was compared with comparative example 1-7, and there was much quantity of persistence in bearing, too. As for the butterfly degree alteration, there are many things more than 60 with comparative example 1-7, but, it was equal to or less than 60 with example 1 to 6, and there was a little softening and was

stable. *chimuken* load ability by bearing steel resistance was examined to evaluate prevention characteristics as opposed to *chimuken* load ability check method smear ring to produce in roller under high contact face pressure and inside and outside coil by bearing steel resistance. Circle was sucked in to a cup experimentally, and an errand, test block cut cylinder thrust bearing W S 81128, and, by means of testing machine of 2220 JIS - K - 5.16, roller bearing cup 09195 was employed. 0.5g applied each sample to top part of block experimentally. The load ability resistance depended on method of 2220 JIS - K - 5.16. The result is shown to table 2. Example 1 to 5 that only degenerative polyolefin doped was 22Lbf, but, that comparative example 1 that comparative example 3 of 0.3% extended, and additive amount of degenerative polyolefin did not dope went low with 15Lbf, and resultant of embodiment seemed to show, and load ability resistance improved by degeneration polyolefin addition was understood. Apparent viscosity and apparent viscosity were appointed according to measuring method of 2220 JIS - K - 5.15. The result is shown to table 2. Because *oshiso* characteristics namely feed and *susa* when grease is sent by the plumbing improve so that apparent viscosity is low, preferred. That apparent viscosity largely increased when additive amount of degenerative polyolefin wax increased as shown in comparative example 4 was understood.

第 1 表

変性種	酸化変性							酸変性	
変性ポリオレフィン番号	1	2	3	4	5	6	7	8	9
分子量 M_w	2000	4000	2000	3200	3200	2100	4700	1500	2700
密度 (g/cm ³)	0.93	0.96	0.98	0.97	0.93	0.96	0.98	0.94	0.
酸価 (mgKOH/g)	1.0	1.0	17	12	17	25	25	60	30
融点 (°C)	107	128	113	115	95	100	115	104	107

第 2 表

実施例番号		1	2	3	4	5
配合量(%)	ジイソシアネート	3.64	3.67	3.55	3.87	3.6
	オクチルアミン	3.19	3.22	2.92	3.58	3.3
	ステアリルアミン	1.17	1.18	1.53	0.83	0.7
	基油	90.50	91.23	90.50	91.01	90.01
	変性ポリオレフィン(第1表中の番号)	1.50 (1)	0.70 (2)	1.50 (6)	0.70 (2)	3.0 (8)
極圧添加剤						
ちょう度	25°C	313	328	318	322	328
滴点	(°C)	260以上	260以上	260以上	260以上	260以
離油度24時間%	100°C	1.6	1.5	1.5	1.5	1.5
	150°C	4.3	4.2	4.3	3.8	3.7
シェルロールテスト						
24時間	水0% 80°C -	357	358	363	362	348
	130°C	345	351	358	349	345
	水10% 40°C	349	362	361	367	353
	80°C	336	349	360	351	340
PV試験	条件1 最高温度 °C(温度振幅)	95 (2)	98 (2)	93 (1)	98 (2)	91 (1)
	条件2 最高温度 °C(温度振幅)	124 (2)	127 (3)	118 (1)	126 (2)	116 (1)
	条件3 最高温度 °C(温度振幅)	127 (8)	130 (10)	125 (5)	128 (10)	125 (3)
	漏洩量 g	145	156	150	151	148
	軸受内残存量 g	48	45	58	52	65
	ちょう度変化	+56	+53	-	-	+48
チムケン耐荷重能lbf		22	22	22	22	22
見掛粘度P 0°C 10 ⁻³		980	970	950	1020	1030

実施例番号		6	比較例 1	比較例 2	比較例 3	比較例
配合量(%)	ジイソシアネート	3.47	3.68	3.52	3.55	2.6
	オクチルアミン	3.04	3.22	3.08	3.11	2.4
	ステアリルアミン	1.11	1.18	1.13	1.14	0.5
	基油	86.19	91.92	87.44	91.90	87.3
	変性ポリオレフィン(第1表中の番号)	1.43 (4)	— —	— —	0.30 (8)	7.0 (1)
極圧添加剤		4.76		4.83		
ちょう度	25℃	329	322	319	324	314
滴点	(°C)	260以上	260以上	252	258	210
離油度24時間%	100℃	1.5	1.6	2.0	1.8	2.6
	150℃	3.8	4.3	6.3	5.2	12.5
シェルロールテスト						
24時間	水0% 80℃	350	361	356	346	358
	130℃ -	344	346	342	341	363
	水10% 40℃	353	358	363	359	365
	80℃	338	343	358	346	381
PV試験	条件1 最高温度 °C(温度振幅)	95 (2)	116 (15)	108 (13)	106 (10)	98 (1)
	条件2 最高温度 °C(温度振幅)	122 (1)	132 (20)	126 (15)	125 (12)	125 (1)
	条件3 最高温度 °C(温度振幅)	122 (7)	165以上 (16以上)*	165以上 (12以上)*	162 (3)	143 (6)
	漏洩量 g	155	156	148	152	155
	軸受内残存量 g	55	20	18	25	48
	ちょう度変化	+58	+54	+62	+60	+87
	チムケン耐荷重能Lbf	30	15	30	15	24
見掛粘度P 0℃ 10 ⁻¹		980	910	940	1080	2450

実施例番号	比較例 5	比較例 6	比較例 7
配合量(%) ジイソシアネート オクチルアミン ステアリルアミン 基油	市販品	市販品	市販品
変性ポリオレフィン(第1表中の番号)			
極圧添加剤			
ちょう度 25°C 滴点 (°C)	322 260	328 258	317 260以上
離油度24時間% 100°C 150°C	1.6 3.9	6.2 5.8	0.6 0.8
ジェルロールテスト 24時間 水0% 80°C 130°C 水10% 40°C 80°C	336 330 308 341	340 363 390 351	392 323 410 440以上
PV試験 条件1 最高温度 °C(温度振幅)	113 (20)	96 (2)	115 (20)
条件2 最高温度 °C(温度振幅)	130 (18)	123 (1)	138 (26)
条件3 最高温度 °C(温度振幅)	165以上 (14以上)*	150 (28)	165以上 (25以上)*
漏洩量 g	163	160	168
軸受内残存量 g	18	32	16
ちょう度変化	+46	+80	+83
チムケン耐荷重能Lbf	15	26	15
見掛け粘度P 0°C 10 ⁻¹	980	920	1100

*: 165°Cとなったためこれ以上温度が上がると試験軸受や試験機が故障するおそれがあるため中止した。

第 3 表

	条件1*1	条件2*1	条件3*2
回転速度 (rpm)	2125	3365	3540
すべり速度V (m/s)	1.2	1.9	2.0
油圧P (kg/cm ²)	15	12.6	13
P×V (kgf・m/wts)	18	24	26

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*1: 条件1、2の試験での軸受内グリース充填量は
80g、小端側、大端側空間に各60g、合計200g。

*2: 条件3では初期充填量は条件1、2と同じで、
テスト5時間後、10時間後に軸受内にさらに60g追加。

[an effect of the invention] because specific ampere adds specific degenerative polyolefin in urea grease, urea grease composition of the present invention breathes circle, and in other words the lubricity ability that is requirement more breathes circle of thrust load as grease for roller bearing high, and lubricity ability as opposed to sliding friction division of roller bearing is particularly superior, temperature rise of bearing plays lubrication effect exceeding the grease which has been employed as concerns a few things conventionally clearly. Even more particularly, Machine stability which is requirement, hydrous shear stability and *oshiso* are sexual, and urea grease composition of the present invention plays superior effect as grease for calender roll neck bearing. In addition, Circle of the present invention is sucked in, and there is a little leak quantity from bearing, too, and grease composition for roller bearing is well held in application by bearing internal, oil sharpness is hard to be produced. Therefore, It is the thing which can control abrasion of bearing in too cruel service condition, and urea grease composition of the present invention can employ as for a long time stabile lubricant.

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